Return to Report Guide

CAPITAL PROJECTS DETAIL

640 NDSU Main Research Center

Version: 2011-R03-00640

Date: 01/13/2011

Time: 12:06:21

Capital Project

Agronomy Laboratories (CREC, HREC, LREC, CGREC)

	Request/Optional	Recommendation
Total Project Cost	5,275,000	0
General Fund	5,275,000	0
Federal Funds	0	0
Special Funds	0	0
Bonding	0	0

Is this a multibiennium project? No **No of Biens:** 1 **Est. Costs** 5,275,000

Future Increased Costs Associated with Project Approval

	2011-2013	2013-2015	2015-2017
Salaries and Wages	0	0	0
Operating Expenses	0	0	0
Equipment > $5,000	0	0	0
IT Equipment > $5,000	0	0	0
Special Lines	0	0	0
Total	**0**	**0**	**0**

	2011-2013	2013-2015	2015-2017
FTE	0.00	0.00	0.00
General Fund	0	0	0
Federal Funds	0	0	0
Special Funds	0	0	0
Total	**0**	**0**	**0**

Project Specifics and Justification

AGRONOMY LABORATORIES - $5,275,000

The Carrington Research Extension Center agronomy program is perhaps the largest and most diverse of the out-state REC's. Yet, this program must perform the duties and processes associated with this large program in an old (1962-era) potato warehouse. For example, more than 25,000 individual samples are handled in multiple processing steps within the confines of this antiquated facility. Over the course of the past 30 years, the CREC agronomy staff has self-renovated the interior of this warehouse to create a degree of functionality given the limitations. First and foremost, the current agronomy laboratory does not meet worker safety and protection standards. The current laboratory has limited space for experiment preparation and processing, sample cleaning, dryers, field sample storage. The current facility completely lacks some basic research functionality such as: dust and air exchange capability; isolated chemical handling space; controlled environment for seed storage; plus there is no room for plant pathology experiments. The innovative and proactive research efforts of CREC agronomist and plant pathologist are severely compromised by the limitations and lack of modern capabilities indicative of the present facility. **(CREC facility estimated cost - $2,250,000).**

The current agronomy and Range research programs at the NDSU HREC have grown beyond the ability of our current Agronomy Lab to house them. The current lab is a converted granary with inadequate sample storage space, inadequate drying ovens, and no internet service or the ability to provide a modern office working environment. Additionally, the HREC has inadequate equipment storage space needed to store the Agronomy research program seed drills and combine and the Range research program's equipment. A modern Agronomy and Range Lab of approximately 8,000 square feet is needed to provide technicians and graduate students with office space, technical facilities in line with modern research (internet access, dust free environments to work on computers, and lab areas for handling radio telemetry

collars for wildlife and domestic livestock), new drying ovens and sampling processing areas, and storage for both research samples and equipment **(HREC facility estimated cost - $1,600,000)**

The LREC has an active agronomy research program that includes all aspects of crop production including, but not limited to, soil health, plant pathology, entomology, crop fertility, weed control, variety development, etc. The LREC currently has no dedicated facility to store, process, and perform an array of tests needed to compile research data that is needed by the regions producers to solve crop production problems and questions. A new agronomy lab would allow LREC scientists to conduct this work and in the long run would save resources that are currently expended shipping research materials away for processing and testing. **(LREC facility estimated cost - $1,100,000).**

With the addition of a forage agronomist at the CGREC, the center is in need of a forage lab/storage building. Currently samples collected in the field by the scientist are processed in a corner of an equipment storage building with a dirt floor. The dust from opening the overhead door and moving equipment renders this area very dusty and difficult to keep scales and computers clean. The new building would house the forage drying ovens, computer, scale etc. for sample data processing. It would also house the grinders and equipment to process the forage samples in preparation for nutrient analysis.

The building would be 40X100 feet with half of the building used for the forage lab and the remainder used for sample and equipment storage. We are now forced to keep plot equipment stored outside where the weather takes its toll on the equipment condition. New plot equipment such as self propelled forage harvesters cost upwards of $100,000 and should be maintained in a clean dry storage environment. **(CGREC facility estimated cost - $325,000).**

Return to Report Guide

CAPITAL PROJECTS DETAIL

640 NDSU Main Research Center

Version: 2011-R03-00640

Date: 01/13/2011

Time: 12:06:21

Capital Project

Research Greenhouse Complex

	Request/Optional	Recommendation
Total Project Cost	9,494,581	9,494,581
General Fund	6,991,650	6,991,650
Federal Funds	0	0
Special Funds	2,502,931	2,502,931
Bonding	0	0

Is this a multibiennium project? No **No of Biens:** 1 **Est. Costs** 9,494,581

Future Increased Costs Associated with Project Approval

	2011-2013	2013-2015	2015-2017
Salaries and Wages	115,000	120,000	125,000
Operating Expenses	653,622	653,622	653,622
Equipment > $5,000	0	0	0
IT Equipment > $5,000	0	0	0
Special Lines	0	0	0
Total	**768,622**	**773,622**	**778,622**

	2011-2013	2013-2015	2015-2017
FTE	0.00	0.00	0.00
General Fund	768,622	773,622	778,622
Federal Funds	0	0	0
Special Funds	0	0	0
Total	**768,622**	**773,622**	**778,622**

Project Specifics and Justification

RESEARCH GREENHOUSE COMPLEX FINAL PHASE - $6,991,650 (general funds) (BL3-Portion - $2,502,931 special funds)

The North Dakota Agricultural Experiment Station (NDAES) needs secure greenhouse space to carry out research on crops to meet customer and consumer demands, and to respond to the threat of bioterrorism. In addition, increased number of plant related research programs, and the expansion of these programs due to increased demand for high quality traits, yield, and pest problems has placed great demand on the existing greenhouse facilities on campus.

This request is to complete the construction of the state-of-the-art facility, which, when completed, will feature conventional, or bio-safety level BL1-P (approximately 29,000 sq. ft), biosafety level BL2-P (approximately 17,000 sq. ft), and biosafety level BL3-P (approximately 1600 sq ft.) greenhouses. Advanced levels of automation and environmental control systems are built into the greenhouse research rooms to provide a more controlled environment and provide additional aid to researchers by monitoring the environment within each research room. Each consecutive bio-safety level ensures an increased level of security and precision, and expands the types of research possible.

This research complex also includes head-house facilities which provide researchers with laboratories and other facilities to facilitate efficient use of the greenhouses, along with providing the infrastructure backbone for mechanical, electrical and heating needs of the complex.

The final proposed phase of construction will include the fourth BL1-P greenhouse range pair and the third BL1-P greenhouse range pair, along with extension of the connecting head-house in the BL-2P area, which will interconnect with the BL3-P containment facility and its associated components and infrastructure. Groundbreaking of the first phase took place in late summer of 2008 and is scheduled for completion will be late winter of 2010. Second phase construction is slated to begin spring of 2010 with completion in summer 2011.

CAPITAL PROJECTS DETAIL **Date:** 01/13/2011
640 NDSU Main Research Center **Time:** 12:06:21
Version: 2011-R03-00640

The location of the facility is in close proximity to other on-campus laboratory research facilities.

Return to Report Guide

CAPITAL PROJECTS DETAIL

640 NDSU Main Research Center

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Date: 01/13/2011

Time: 12:06:21

Capital Project

Seed Conditioning Plants (NCREC, CREC, WREC, LREC)

	Request/Optional	Recommendation
Total Project Cost	8,400,000	0
General Fund	8,400,000	0
Federal Funds	0	0
Special Funds	0	0
Bonding	0	0

Is this a multibiennium project? No **No of Biens:** 1 **Est. Costs** 8,400,000

Future Increased Costs Associated with Project Approval

	2011-2013	2013-2015	2015-2017
Salaries and Wages	0	0	0
Operating Expenses	0	0	0
Equipment > $5,000	0	0	0
IT Equipment > $5,000	0	0	0
Special Lines	0	0	0
Total	**0**	**0**	**0**

	2011-2013	2013-2015	2015-2017
FTE	0.00	0.00	0.00
General Fund	0	0	0
Federal Funds	0	0	0
Special Funds	0	0	0
Total	**0**	**0**	**0**

Project Specifics and Justification

SEED CONDITIONING PLANTS - $8,400,000

The NCREC has identified the need for a new, one story, high side-wall, Foundation grade seed conditioning facility capable of gently handling pulse crops, oil seeds, and other crops is. A portion of the building needs heating to house electronic eye, seed sorting equipment. Explosion proof fixtures, pure-seed conveyors and elevators, dust handling equipment, and a series of seed conditioning machines are included. The present facility, originally built in 1949 and added on in 1982 is too small, inefficient, and is a health and safety problem due to inadequate dust handling. It is not equipped to handle pulse crops and oilseeds without excessive seed damage. Two hundred thousand dollars in deferred maintenance is alleviated if constructed. (NCREC facility estimated cost - $3,000,000)

The current seed plant at CREC was constructed in 1963 and is seriously out of date. The current plant is not designed to readily accommodate air exchange and dust control mechanical features to address worker safety concerns. The present building is too small to retro-fit with larger capacity seed conditioning equipment. The CREC must heavily rely upon the use of a mobile mill to condition the majority of the seed products produced and managed by this department. **(CREC facility estimated cost - $3,000,000).**

The current building at WREC used to house the foundation seed conditioning equipment was built in the mid 1950's. The area designated to unload trucks can only accommodate a small single axle truck and does not have sufficient unloading capacity. Grain legs that move the dirty and clean grain are all too small for efficient

movement of grain. We are limited to cleaning a maximum of 45 bushels per hour by the current grain leg size. Upgrading grain legs is difficult to near impossible in this building because of space limitations. Equipment for the distribution and conditioning of grain is currently located on five different floor levels in the building, creating potential worker safety issues and problems associated with constant stair climbing. The conditioning plant is cleaned thoroughly at every level between each crop variety that is conditioned in order to insure seed purity for Foundation Seed production. This means that in 2009-2010 the conditioning plant will need to be hand cleaned about 20 times, a task that now takes two people approximately ten hours to complete. Clean down time could be cut by 50-60% in a new one story building. Cleaning capacity could be increased from 35 bushels/hour to 100-125 bushels/hour, if we used the same cleaning equipment (scalper sieve cleaner, indents and gravity) currently being used. New grain legs would have a capacity of moving 200 bushels of seed/hour and with improved equipment; the plant capacity can be upgraded to 200 bushels/hour for future use if needed. The building would need to be minimally heated with grain bagging capabilities. New conditioning equipment cost should be less than $200,000. Seed conditioning season runs from November through February and sometimes into March. This building would be needed to house a mobile grain cleaning mill also, if that option is chosen since conditioning grain outside in cold weather is very undesirable and in most cases nearly impossible. Mobile mill costs vary, but range from $450,000-$700,000. **(WREC facility estimated cost - $1,400,000)**

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The LREC produces an average 15,000 bushels of regionally adapted foundation seed production for use by the regions producers in their cropping enterprise. The current foundation seed facility at the LREC was constructed in 1962 and utilizes the same equipment. It is outdated, inefficient and needs to be modernized to support a foundation seed system demanded by the region's producers. In 2008, the condition of the seed cleaning plant was cited as the number one safety hazard by the NDSU Safety Office on the grounds of the LREC. This can only be corrected with a major renovation. **(LREC facility estimated cost - $1,000,000)**